CLAIMS

1. A variable gain amplifier circuit comprising:

a plurality of common-emitter amplifier circuits which are different in voltage gain and employ bipolar transistors and

switch means for selecting the plurality of amplifier circuits, wherein:

the bases of the bipolar transistors are connected in common with each other; and the switch means are connected to the respective emitter sides of the bipolar transistors.

2. A variable gain amplifier circuit comprising:

a plurality of amplifier circuits which are different in voltage gain and employ bipolar transistors and formed with an common-emitter and common-base cascade connection and

switch means for selecting the plurality of amplifier circuits, wherein:

the bases of the common-emitter bipolar transistors are connected in common with each other; and the switch means are connected to the respective emitter sides of the bipolar transistors.

3. The variable gain amplifier circuit as claimed in either claim 1 or claim 2, wherein a collector current ratio between the plurality of amplifier circuits is inversely proportional to an emitter degeneration resistance ratio.

4. The variable gain amplifier circuit as claimed in one of claims 1 to 3, wherein an emitter area ratio between common-emitter transistors in the plurality of amplifier circuits is inversely proportional to the emitter degeneration

resistance ratio.

5. The variable gain amplifier circuit as claimed in one of claims 1 to 4, wherein the emitter area ratio between the common-emitter transistors in the plurality of amplifier circuits is in powers of 2.

6. The variable gain amplifier circuit as claimed in one of claims 1 to 5, wherein the emitter degeneration resistance ratio between the plurality of amplifier circuits is in powers of 2.

7. The variable gain amplifier circuit comprising:

a plurality of common-source amplifier circuits which are different in voltage gain and employ field effect transistors and

switch means for selecting the plurality of amplifier circuits, wherein:

the gates of the field effect transistors are connected in common with each other; and the switch means are connected to the respective source sides of the field effect transistors.

8. A variable gain amplifier circuit comprising:

a plurality of amplifier circuits which are different in voltage gain and employ bipolar transistors and formed with a common-source and common-gate cascade connection and

switch means for selecting the plurality of amplifier circuits, wherein:

the gates of the common-source field effect transistors are connected in common with each other; and the switch means are connected to the respective

source sides of the field effect transistors.

9. The variable gain amplifier circuit as claimed in either claim 7 or claim 8, wherein a drain current ratio between the plurality of amplifier circuits is inversely proportional to a source degeneration resistance ratio.

10. The variable gain amplifier circuit as claimed in one of claims 7 to 9, wherein a gate width ratio between common-source transistors in the plurality of amplifier circuits is inversely proportional to the source degeneration resistance ratio.

11. The variable gain amplifier circuit as claimed in one of claims 7 to 10, wherein the gate width ratio between the common-source transistors in the plurality of amplifier circuits is in powers of 2.

12. The variable gain amplifier circuit as claimed in one of claims 7 to 11, wherein the source degeneration resistance ratio between the plurality of amplifier circuits is in powers of 2.

13. The variable gain amplifier circuit as claimed in one of claims 1 to 12, wherein the switch means is a current source.

14. The variable gain amplifier circuit as claimed in one of claims 1 to 12, wherein the switch means is a transistor.

15. The variable gain amplifier circuit as claimed in one of claims 1 to 12, wherein the switch means is an inverter.

16. The variable gain amplifier circuit as claimed in one of claims 1 to 15, having bias circuits respectively corresponding to the plurality of amplifier circuits.

17. The variable gain amplifier circuit as claimed in one of claims 1 to 16, having a decoder as decoding means for receiving and decoding a digital signal and selecting any one of the plurality of amplifier circuits by its output corresponding to the digital signal received.

18. The variable gain amplifier circuit as claimed in one of claims 1 to 16, having a decoder as decoding means for receiving and decoding a digital signal and selecting any combination of amplifier circuits by its output corresponding to the digital signal received.

19. The variable gain amplifier circuit as claimed in one of claims 1 to 16, having decoding means for receiving and decoding a digital signal, including a first decoder for selecting one of the plurality of amplifier circuits by its output corresponding to the digital signal received and a second decoder for selecting any combination of amplifier circuits by its output corresponding to the digital signal received.

20. The radio communication apparatus having the variable gain amplifier

circuit as claimed in one of claims 1 to 19 as an amplifier circuit.